IN THE CLAIMS

A listing of all claims and their current status in accordance with 37 C.F.R. § 1.121(c) is provided below.

1. (currently amended) A method for processing signals in a pulse oximeter to determine oxygen saturation and pulse rate, comprising:

receiving waveforms corresponding to two different wavelengths of light from a patient;

ensemble averaging ~~said~~ the waveforms in a first ensemble averager using variable weights;

calculating a pulse rate based on an output of ~~said~~ the first ensemble averager;

selecting first metrics for the first ensemble averager to optimize calculating the pulse rate;

normalizing ~~said~~ the waveforms to produce normalized waveforms;

ensemble averaging ~~said~~ the normalized waveforms in a second ensemble averager using variable weights; ~~and~~

calculating an oxygen saturation based on an output of ~~said~~ the second ensemble averager; and

selecting second metrics for the second ensemble averager to optimize calculating the oxygen saturation.

2. (cancelled)

3. (currently amended) The method of claim [2] 1 wherein ~~said~~ the first and second metrics both include an arrhythmia metric for detecting an arrhythmic pulse, ~~said~~ the arrhythmia metric for ~~said~~ the first metrics, in connection with calculating [a] the pulse rate, having a lower associated threshold for recognizing arrhythmia than ~~said~~ the arrhythmic metric for ~~said~~ the second metrics.

4. (currently amended) The method of claim [2] 1 wherein ~~said~~ the first and second metrics both include a short term metric which is a measure of short-term changes in pulse amplitude;

~~said~~ the first ensemble averager increasing an ensemble averaging weight in response to a short-term decrease in pulse amplitude faster than ~~said~~ the second ensemble averager.

5. (currently amended) A pulse oximeter for determining oxygen saturation and pulse rate, comprising:

a detector ~~which receives~~ configured to receive waveforms corresponding to two different wavelengths of light from a patient;

a first ensemble averager configured to average the waveforms;

a pulse rate calculator~~, coupled to~~ configured to calculate a pulse rate based on an output of ~~said~~ the first ensemble averager;

a normalizer ~~coupled to said detector for normalizing said~~ configured to normalize the waveforms to produce normalized waveforms;

a second ensemble averager configured to average the normalized waveforms; ~~and~~

an oxygen saturation calculator configured to calculate an oxygen saturation based on ~~coupled to~~ an output of said second ensemble averager; and

a signal quality metric calculator configured to provide first metrics for the first ensemble averager to optimize calculating the pulse rate, and second metrics for the second ensemble averager to optimize calculating the oxygen saturation, wherein the ensemble averagers are configured to ensemble average using variable weights.

6. (cancelled)

7. (currently amended) A method for processing signals in a pulse oximeter to determine oxygen saturation and pulse rate, comprising:

receiving waveforms corresponding to two different wavelengths of light from a patient;

low pass filtering ~~said~~ the waveforms in a first low pass filter;

calculating a pulse rate based on an output of ~~said~~ the first low pass filter;

normalizing ~~said~~ the waveforms to produce normalized waveforms;

low pass filtering ~~said~~ the normalized waveforms in a second low pass filter; ~~and~~

calculating an oxygen saturation based on an output of ~~said~~ the second low pass filter;

selecting first metrics for the first low pass filter to optimize the calculating the pulse rate; and

selecting second metrics for the second low pass filter to optimize calculating the oxygen saturation.

8. (cancelled)

9. (currently amended) The method of claim [8] 7 wherein:

the low-pass filtering weight associated with ~~said~~ the first low pass filter is based on a frequency ratio metric which quantifies the frequency-content of ~~said~~ the waveforms relative to a pulse-rate estimate.

10. (currently amended) The method of claim [8] 7 wherein:

a low-pass filtering weight for ~~said~~ the second low pass filter is based on

a frequency ratio metric which quantifies the frequency-content of ~~said~~ the waveforms relative to a pulse-rate estimate that metric, and

a separate Ratio-of-Ratios variance metric.

11. (currently amended) A method for processing signals in a pulse oximeter to determine oxygen saturation and pulse rate, comprising:

receiving waveforms corresponding to two different wavelengths of light from a patient;

low pass filtering and ensemble averaging ~~said~~ the waveforms in a first low pass filter and ensemble averager;

calculating a pulse rate based on an output of ~~said~~ the first low pass filter and ensemble averager;

normalizing ~~said~~ the waveforms to produce normalized waveforms;

low pass filtering and ensemble averaging ~~said~~ the normalized waveforms in a second low pass filter and ensemble averager; and

calculating an oxygen saturation based on an output of ~~said~~ the second low pass filter and ensemble averager.

12. (currently amended) A pulse oximeter for determining oxygen saturation and pulse rate, comprising:

a detector which receives waveforms corresponding to two different wavelengths of light from a patient;

a first low pass ~~filtering~~ filter configured to filter the waveforms;

a pulse rate calculator~~, coupled to~~ configured to calculate a pulse rate based on an output of ~~said~~ the first low pass filter;

a normalizer ~~coupled to said detector for normalizing said~~ configured to normalize the waveforms to produce normalized waveforms;

a second low pass filter configured to filter the normalized waveforms; ~~and~~

an oxygen saturation calculator ~~coupled to~~ configured to calculate an oxygen saturation based on an output of ~~said~~ the second low pass filter; and

a signal quality metric calculator configured to provide first metrics for the first low pass filter to optimize calculating the pulse rate, and second metrics for the second low pass filter to optimize calculating the oxygen saturation, wherein the low pass filters are configured to ensemble average using variable weights.

13. (cancelled)

14. (currently amended) The pulse oximeter of claim 12 wherein:
the low-pass filtering weight associated with ~~said~~ the first low pass filter is based on a frequency ratio metric which which quantifies the frequency-content of ~~said~~ the waveforms relative to a pulse-rate estimate.

15. (currently amended) The pulse oximeter of claim 12 wherein:
a low-pass filtering weight for ~~said~~ the second low pass filter is based on
a frequency ratio metric which which quantifies the frequency-content of ~~said~~ the waveforms relative to a pulse-rate estimate that metric, and
a separate Ratio-of-Ratios variance metric.

16. (currently amended) A pulse oximeter for determining oxygen saturation and pulse rate, comprising:
a detector which receives waveforms corresponding to two different wavelengths of light from a patient;
a first low pass ~~filtering~~ filter and ensemble averager configured to filter and to average the waveforms;
a pulse rate calculator~~, coupled to~~ configured to calculate a pulse rate based on an output of ~~said~~ the first low pass filter and ensemble averager;
a normalizer ~~coupled to said detector for normalizing said~~ configured to normalize the waveforms to produce normalized waveforms;
a second low pass filter and ensemble averager configured to filter and to average the normalized waveforms; and
an oxygen saturation calculator ~~coupled to~~ configured to calculate an oxygen saturation based on an output of ~~said~~ the second low pass filter and ensemble averager.

17. (currently amended) A method for processing signals in a pulse oximeter to determine oxygen saturation, comprising:

receiving waveforms corresponding to two different wavelengths of light from a patient;

processing a new waveform after a pulse period trigger to ensemble average with a historical average waveform; and

when ~~said~~ the new waveform differs from ~~said~~ the historical average waveform by more than a predetermined threshold, interpolating between the new waveform and the historical average waveform for a first few samples of a new, composite historical average waveform.

18. (currently amended) The method of claim 17 wherein ~~said~~ the first few samples are four samples, and ~~said~~ the interpolations are at 80%, 60%, 40%, and 20% of the difference between the new waveform and the historical average waveform.